Evaluation of different water regimes on Hevea brasiliensis grown on Haplic Ferralsol soil at nursery stage

ABSTRACT

The main source of natural rubber is from Hevea brasiliensis. Demand for natural rubber is expected to increase once more with increasing of crude oil price and demand for developing automotive industry in several countries. Suitable planting areas decreases and invaluable water resource has been new challenges. This study will provide details about effect of water deficiency in Hevea brasiliensis. Two new latex timber clones from Malaysia Rubber Board (MRB), RRIM 2001 and RRIM 3001 were used in this study. Five levels of treatment were used; plants irrigated for every two days, five days, 10 days, 15days and everyday which acted as control. The experimental design used was a completely randomized block design (RCBD) with four replications. Fundamental changes of plant growth and physiological responses showed that treatment with well watered for clone RRIM 2001 (T1) had higher values than other treatments. Photosynthesis rate highest in well watered (T6) with mean 11.26μmol m-2s-1, while T4, T5 and T9 were lowest with the mean 0.00μmol m-2s-1. Stomata conductance showed significant difference between T6 with 0.16μmol m-2s-1 compared to under stress treatments with 0.00 μmol m-2s-1. The results also showed root length increase with increasing of water stress. There was treatment failure to adapt to water stress at treatments withholding water for 15 days followed by treatments 10 days and five days. RRIM 2001 and RRIM 3001 clones had responded to water stress by indicating changes in morphological and physiological responses. This concluded that Hevea brasiliensis cannot withstand water stress at nursery stage and replanting in dry areas.

Keyword: Rubber; Latex Timber Clones (LTC); Water stress; Growth; Physiological; Responses; Dry areas.